

FIG. 1

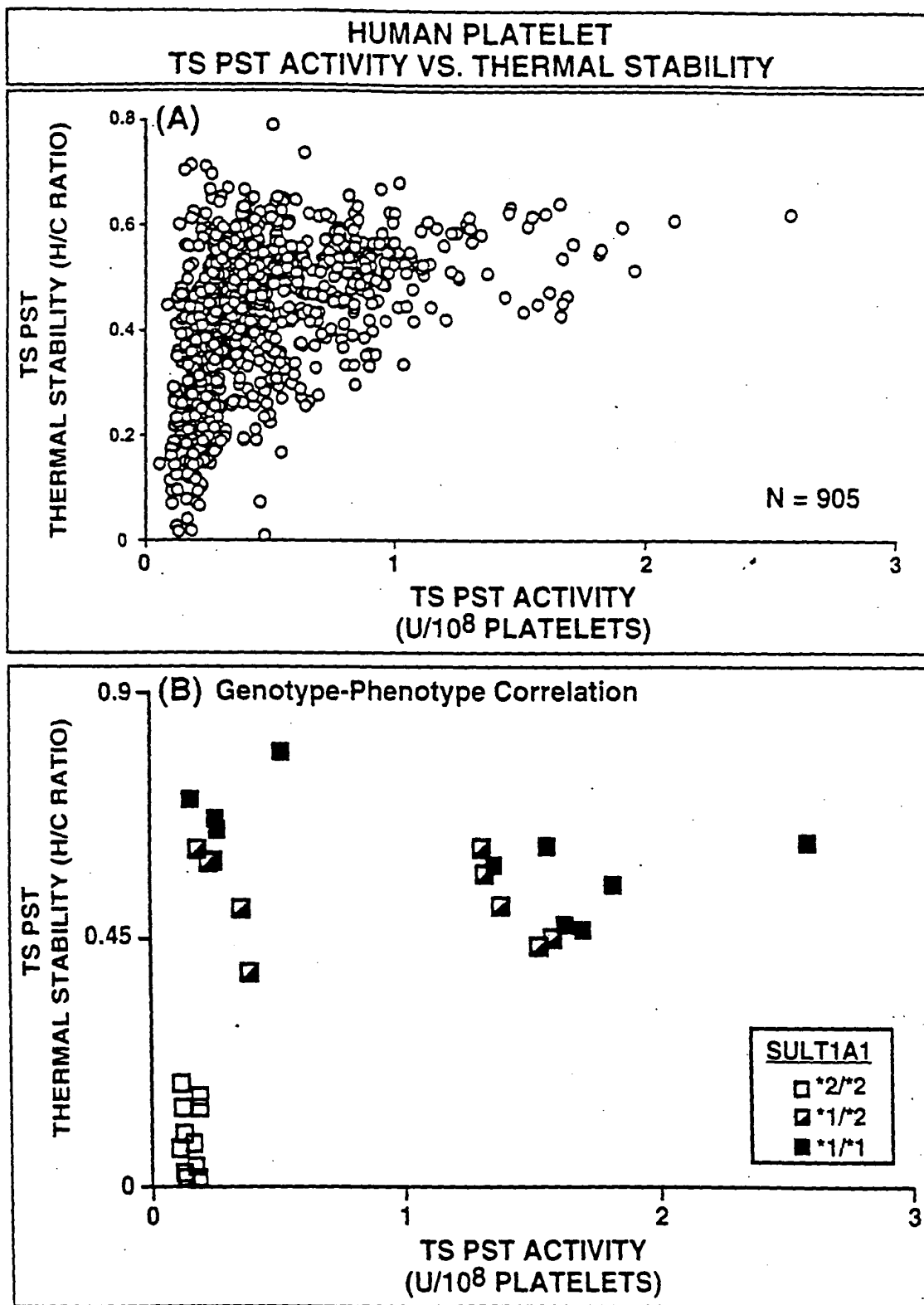


FIG. 2

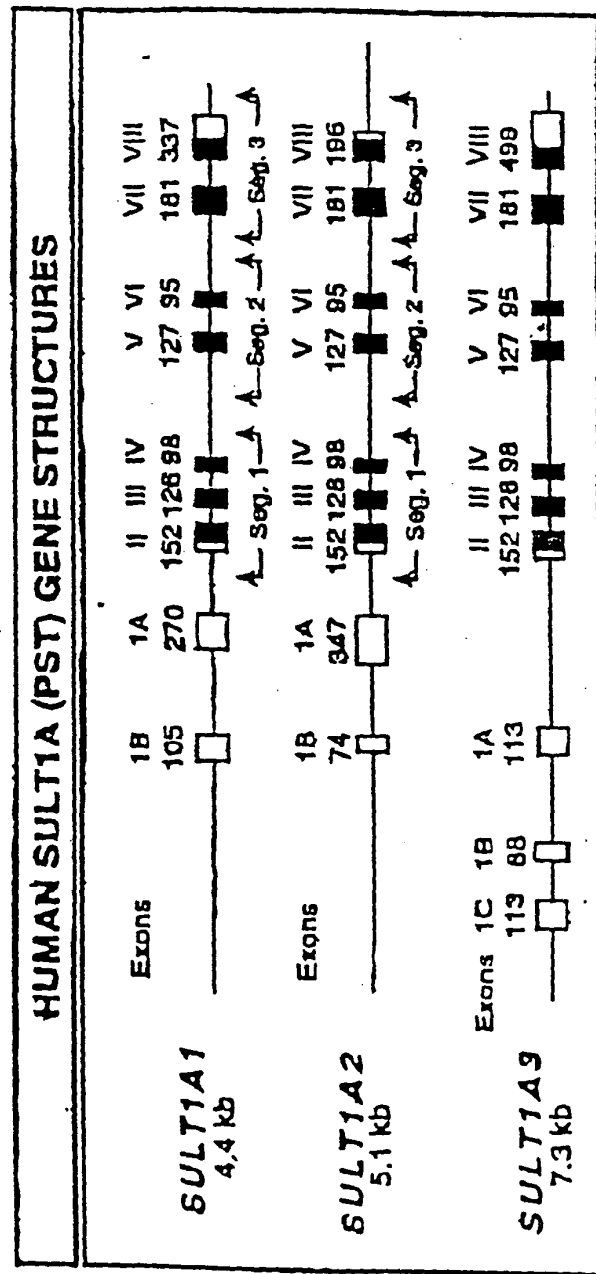


FIG. 3

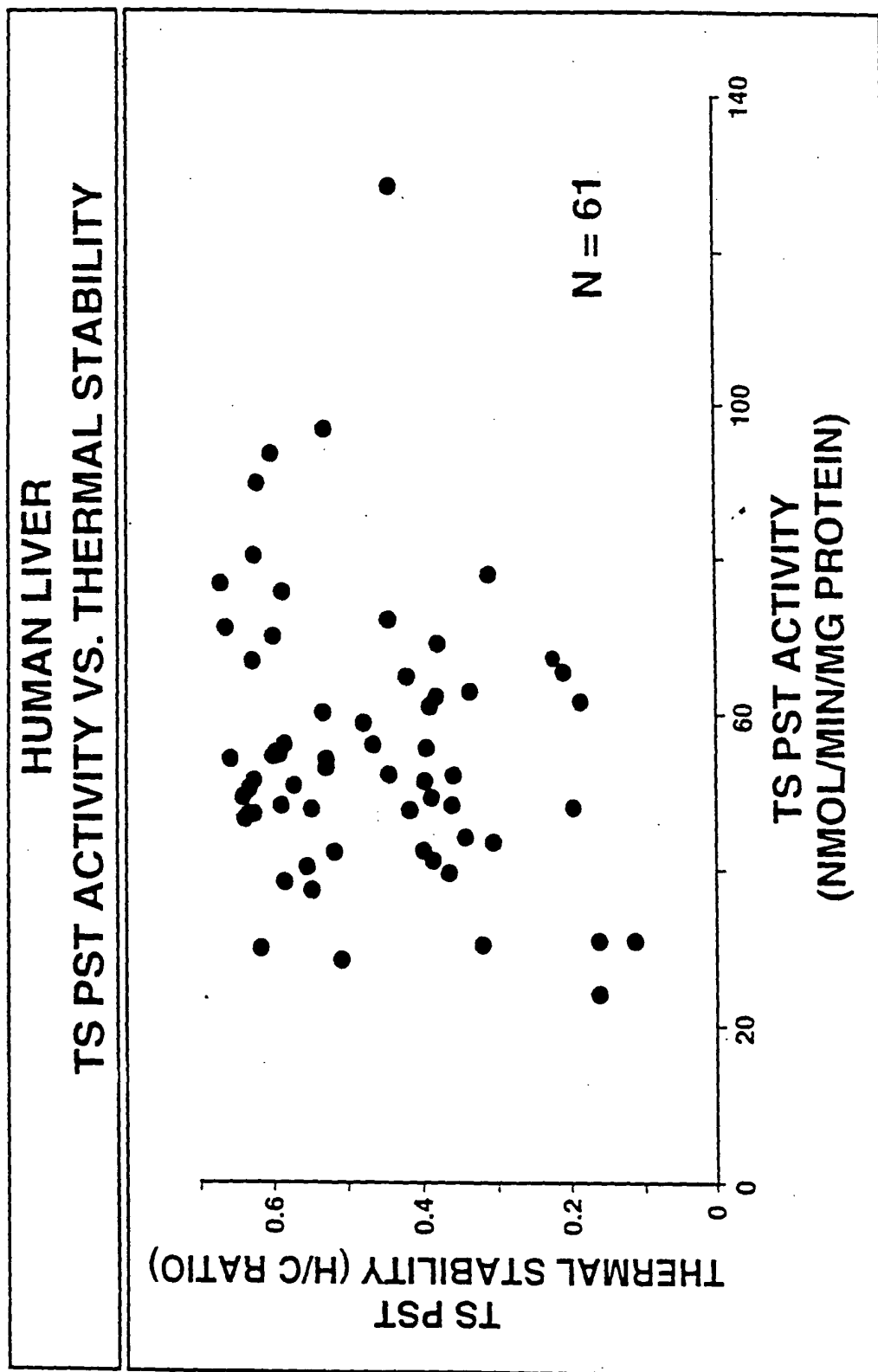
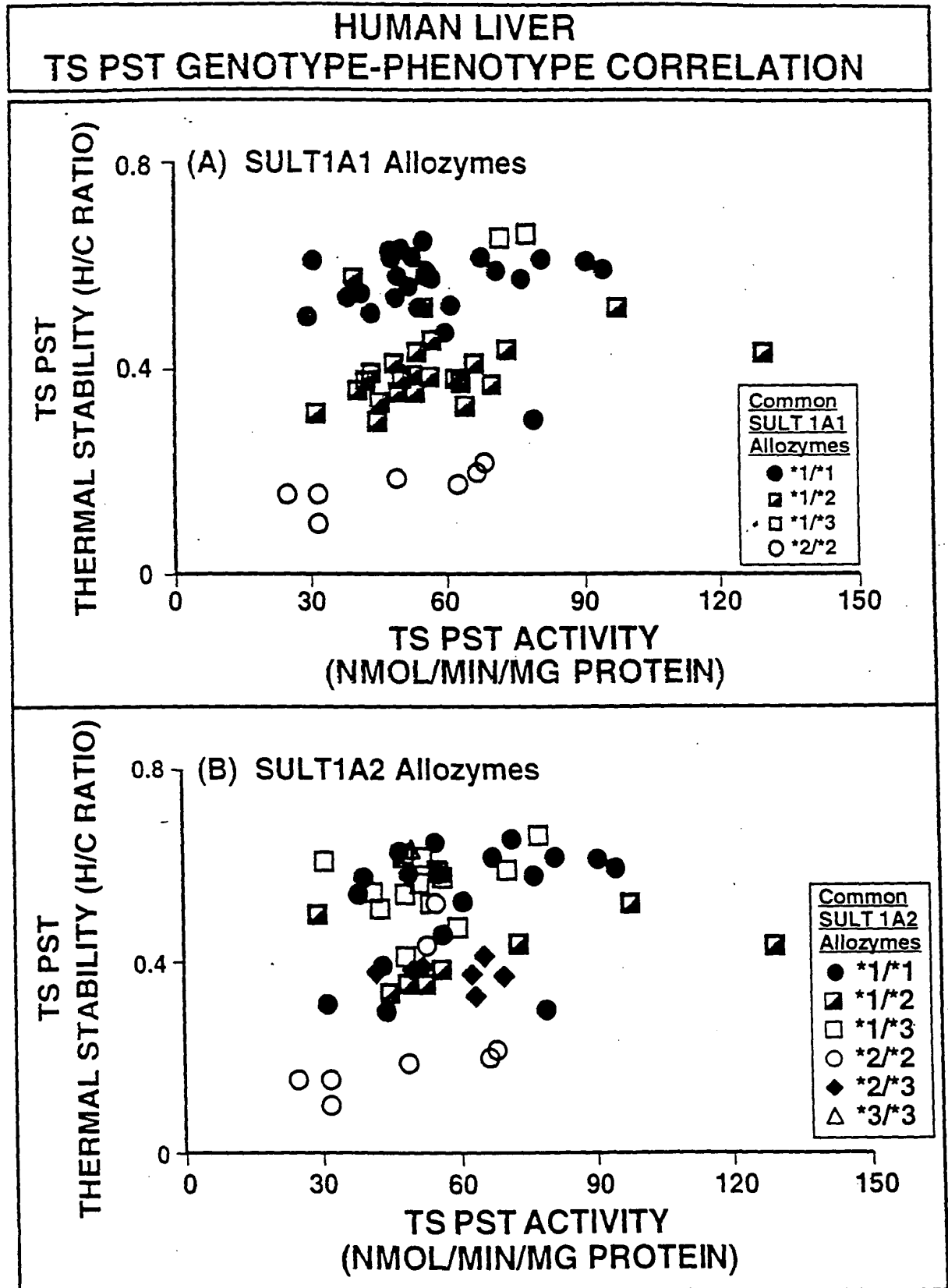


FIG. 4



## HUMAN *SULT1A1* GENE SEQUENCE

101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842. 843. 844. 845. 846. 847. 848. 849. 850. 851. 852. 853. 854. 855. 856. 857. 858. 859. 860. 861. 862. 863. 864. 865. 866. 867. 868. 869. 870. 871. 872. 873. 874. 875. 876. 877. 878. 879. 880. 881. 882. 883. 884. 885. 886. 887. 888. 889. 890. 891. 892. 893. 894. 895. 896. 897. 898. 899. 900. 901. 902. 903. 904. 905. 906. 907. 908. 909. 910. 911. 912. 913. 914. 915. 916. 917. 918. 919.

Figure 1. J027142 gene sequence. Exon sequence is shown in uppercase, while intron, 5'-flanking region and 3'-flanking region sequence is in lowercase. The "ATG" translation initiation codon and the "TGA" translation termination codon are underlined. Amino acid sequences encoded by the gene is listed in single-letter code beneath the nucleotide sequence.

FIG. 6

## HUMAN *SULT1A2* GENE SEQUENCE

[illegible]

Figure 2. *SULT1A3* gene sequence. Exon sequence is shown in uppercase, while intron, 5'-flanking region and 3'-flanking region sequence is in lowercase. Amino acid sequence encoded by the gene is listed in single-letter code beneath the nucleotide sequence.

FIG. 7

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1  acctctgcct cctgggttcca agcaatcctc cttcctcacc ctccagagta gctgggatta
61  caccgcgcctg ccaccgcgcc tggcctaatt tttgtatttt tagtagagat ggggggtttcc
121 aaccatggtg gccaggctgg tctccaaact cctgacctca ggtgatcctg cccacctaaag
181 cctcccaaaa tgctggtatt acaggcatga gccaccgtgc ccggcctaaa taattaataa
241 aataatggac gatgggtgcc ttctactgag ctccccgtaa ttgtgagtga gtagaggact
301 tggcctgggg acattcagtg acctgctggg tgttgctgag ctgtgaggaa gttcaggctc
361 ggctgcagtg gtgaggctgt gactcaatca atcactgctg atgtctccag gacctgcacc
421 agcttagtcc taggggcaag gattttaact gtccacctca gtttcttcat ttgtaagatg
481 caaataacag tcacctctgc ctcatgggat ggagctgtgt aatgcccgca acagtgcctg
541 ctgcatagag gggttgctgc cagctgcctc tccctccttg tctcttacct gcctgctgcc
601 tggctcacga tgaagaccca ccttctgtgt gccccacccc tggtgcctg ctaagggccc
661 atgtgatctg cctggcagag gagtttcttc aggaagaacc agggcagctt ctgcccctag
721 agggccaatg cccttctgta gtgcagctcc ctggcccccag cctgggtccac ctctgggaag
781 aggggtgccc gttgtgcaat ccaggcccgag gcagctgagc cctcatctca gcatgcaggg
841 cggatactgg agggggcttg tggcatctga ctctgtatct cctacctgcc cctctccttg
901 gtagctgtga gaagtcaact ctttggggag acctgatctg gctgtgccag atggacactg
961 agaaagaagt agaagactca gaattagaag aggtgagtgg gctttgggtg cgggctccct
1021 accccactcc ctgcccctggg ctgcccgtga ccacactgct tgccctctga ggcacactgg
1081 acagacctgc tggagacctg atcctcagtg tccttacctc ctccctaccc ttttctgtgc
1141 cacctgctgt ggggtccagca ggtttttact tgagtacaat aaaaagtcg agtcaagggt
1201 gccttatggt ggatgctgag gggaggggag gagctagtag cccaaggtcc tgccagtcac
1261 ggggcttccct caggggcaca gaggaggcag gaggggcccc tggccctagc acgtgaacag
1321 cttctactct gcctggaac cccatgcctc agctttcccc tacttgctc tgagctcatg
1381 caattcttgg aagcctggga gacttacctt gaaattgaat gcaaatagga caaagaccaa
1441 ggaggatggg gggatgccct ccttccacgg ggccctgtgg cttccaagtc ttaatctcct
1501 ctagtctctt gtctacggag cctcctcaa acccaggga agaaaagcac ctgccagggt
1561 tgtttttctt ctaggatctt ctattgatgc tctgtgaggt ccccaggag ccatgaagct
1621 agggctggct cctagggcaa tgggactaca gtgtccttgt cctttcttct tctttctgtt
1681 ctttctttct ttttttttt ttttttttgg acagagtctc actctgttgc
1741 ccaggctgga gtgcagtgg gtgatcttgg ctactgaaa cctccgctc ctgggttcaa
1801 gtgattctct tgccctagcc tcctgagttag ctaggattac aggtgcccgc catcatgccc
1861 agctaatttt tgtattttta gtagagacag ggtttcacca tgttgggcag cttggtctcg
1921 aactcctgac ctgagtgat cctgctgcat cgacctcca aagtactggg attacaggcg
1981 tgagccacca cgctcagcct ctttcttgtt ctatatgtcc atgtctgtct ccacttctgc
2041 cccttcactc tgccccacac atcactccag actggccttg tggtcagagc ctggaatgcc
2101 tgggctgctg ggggcctgtg gactgcactg ggcagaacc cctgcccctc tcaagactgg
2161 cctgtagcca gcaggtaggt gacttttccc agggcggcct atcccacct tcccctccac
2221 tcactcacct cccttgccct ggtcaattag agaaagcttg tcggccaggc atgggtggctc
2281 atgcctgtaa tctcagcact ttgggaggcc gaggggggag gatcatctga gctcaggagt
2341 ttgagaccag cctggccaac atggcaaaac cccgtctcta ctaaaaatac aaaaattaac
2401 cggatgtggg ggtgtgcacc tgtaatccca gctactcggg aggtgagagc agaagaatcg
2461 cttgaacca ggagggggag gttacagtga gcggagatcg tgctactgca ttgcagcctg
2521 ggcgagagag cgagtctcca tctcacataa aaaaaagaaa aagaaagaaa gcaagcttgt
2581 ctgttgccct gccctgcagg gtggagtcca gaggaaggt caggagccta gtgacagctc
2641 aaaaaaaaaa aaacccaaat accaatgttg gcccttttg cctttcattc atgtgttttc
2701 tataactaa actcacatat tgggttttga gatcactcca agcttggctg gagctgtggg
2761 ggtaaggagg gtaatagaga agcttcccca cctcaaccc cacccttccc ttcctggagt
2821 tcccagccct gacttttagat cctcccaca ctggaccttc aaaacctca gggcagagag
2881 cagccctaca ctccctacac cacaccata ctgagccctc gcaggcaagg agagaacagg
2941 tcaggttccc gaaagctcag gtgagtgaac cgttgggaatg gccaggggca ccttcacctt
3001 gctcagcttg tggctccaac attctagaag ccgaggcctc tgccatccct gccctttccc
3061 atggatatcc catttcaatt agacaacca gcccgcccg aatccccctg cgttctctct
3121 tttcctttgt gtatttttga gacagggtgt tgctccgtca cccaggctgg agtgtagtgg
3181 gatcctggcc cactgcagcc tcaaattcct aggtctgaggc aatcctgccg cctcagcctc

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FIG. 7 CONT.

|      |            |             |            |             |             |             |
|------|------------|-------------|------------|-------------|-------------|-------------|
| 3241 | ctgagtagct | ggsgttacaa  | gagcaagcca | ccacaccag   | ctaattttga  | aaaatatttt  |
| 3301 | ttgtagagga | gaggtcttgc  | tttgttgtec | aggttggtct  | caaactccag  | ggctcaaggg  |
| 3361 | atcctttccc | gttgccctcc  | caaggctctg | ggattacagg  | cgggagtcac  | cctgcctggg  |
| 3421 | cccctscctt | tgatgagtc   | tcagttttca | ttcccgcacg  | aggctctagc  | ccctgggtacc |
| 3481 | agcttagttg | ctcaatgggc  | tgtgtttgtt | ctggagccca  | gatggactgt  | ggccaggcaa  |
| 3541 | gtggatcaca | gacctggccg  | gcctgggagg | ttccacatg   | tgaggggcat  | gagggsggct  |
| 3601 | caaggagggg | agcatcgggg  | agaggagcgc | actgggtgga  | ggctgggggt  | cccagcagga  |
| 3661 | aatggtgaga | caaagggcgc  | tggctggcag | ggagacagca  | caggcaggcc  | ctagagcttc  |
| 3721 | ctcagcacag | ctggactctc  | ctggagacct | tcacacaccc  | tgatatctgg  | gccccgcgct  |
| 3781 | acgagsggtg | tttcaactgg  | ctgcactatg | ccccaggccc  | tgggattttg  | aacagctctg  |
| 3841 | caggtgactg | aaagggtgcg  | ccaggctggg | gaacgacctg  | gtttcagccc  | cagccccgcc  |
| 3901 | actgactgac | tttgtgagtg  | cgggcaagtc | actcagcctc  | cctaggcctc  | agtgaattcc  |
| 3961 | ctgaaagcaa | aaactctgca  | aaggggcagc | tgggtgctgg  | ctcacacctg  | taatcccagc  |
| 4021 | actttgggag | gctgaggtag  | acaaatcact | tgaggccagg  | agttctagac  | cagcctggcc  |
| 4081 | aacatggtga | aaccccatct  | ctactaaaga | aaaaaaaaaa  | ttagctgagc  | atggttgtac  |
| 4141 | atgcttgtaa | tcccagctac  | ttgggatgcc | gaggcgggag  | gattgcttga  | acccaagagg  |
| 4201 | tggagtttgc | agtgaactga  | gattgtgcca | cactgcactc  | cagcttgggt  | gagagtgaga  |
| 4261 | ctccatctca | aaaaaaaaaa  | aaaaaagaga | gaatcccact  | ttcttgcctg  | tgtgatgggt  |
| 4321 | gtaaggggaa | gggcctggct  | ctggcccctg | atgcaggaa   | atggagctga  | tccaggacac  |
| 4381 | ctcccccccg | ccactggagt  | acgtgaaggg | ggctcccgctc | atcaagtact  | ttgcagaggg  |
| 4441 | actggggccc | ctgcagagct  | tccaagcccg | acctgatgac  | ctgctcatca  | acacctaccc  |
| 4501 | caagtctggt | aagtgaggag  | ggccacccac | cctctcccag  | gcggcagtc   | ccaccttgg   |
| 4561 | cagcaagggt | gtgcccctcag | cctgctcacc | tcctatctcc  | ctccctctcc  | aggcaccacc  |
| 4621 | tgggtgagcc | agatactgga  | catgatctac | cagggcgggc  | acctagagaa  | gtgtaaccgg  |
| 4681 | gctcccatct | acgtacgggt  | gcccttcctt | gaggtcaatg  | atccagggga  | accctcaggt  |
| 4741 | gcattggctg | gtcctggggg  | taagggaagt | ggagggaagc  | agggctgggg  | cttcagctca  |
| 4801 | ccagaccctc | cctgaccac   | tactcagggc | tggagactct  | gaaagacaca  | ccgccccac   |
| 4861 | ggctcatcaa | gtcacacctg  | cccctggctc | tgctccctca  | gactctgttg  | gatcagaagg  |
| 4921 | tcaaggtgag | gccgggtc    | atggttcaca | cctgtcatcc  | cagtttgaga  | ctgaggagg   |
| 4981 | aggatccctt | gaaggcgaga  | gatggagacc | agcctgggca  | acattgctgt  | agagatgaca  |
| 5041 | tcccatctct | acaaaaataa  | aattaacaac | ctggtatggt  | ggcatagact  | gttcccagtt  |
| 5101 | acttaggagg | ctcagcgggg  | aggactgttt | atgcaaatag  | gaagctgcaa  | tgagccctga  |
| 5161 | tgatcctgct | gctgcactcc  | agcctgggca | acacagcaaa  | accatctcta  | cgaaaaaaaa  |
| 5221 | agttcccact | gactggcaag  | gaaagccagg | aaggggggct  | caggtgccct  | ctcagccatg  |
| 5281 | tacctgttct | tctggaaggg  | cctcctcgct | tctgccaggc  | tcacacatc   | ttttttttt   |
| 5341 | ttgagacaga | gtcttgctct  | gtcaccctgg | ctggagtga   | gtggcatgat  | ctcagctcac  |
| 5401 | tgcaacctcc | gcctcccag   | ttcaagtgat | tctcctgct   | cagcctcctg  | agtagctggg  |
| 5461 | attacagctg | tg-gctacca  | caccgggcta | atttttgat   | tctttttagt  | agagacgggg  |
| 5521 | tttcaccatg | ttgggtcaagt | ggatctcaaa | ctcttgacct  | tgtgatcctc  | ctgctctgac  |
| 5581 | ctcacaaggt | gctggaatta  | caggcgtgag | ccaccgcgcc  | tgcccttttt  | tttttttgag  |
| 5641 | acagtttcac | tcttggtgcc  | gaggctagag | cgcaatcgtg  | tgatctcggt  | tactgcaac   |
| 5701 | caccgcctcc | tgggttcaag  | caattctcct | gcttcagcct  | cccaaggagc  | tgggattaca  |
| 5761 | ggtacctgcc | accacgcccc  | gctaattttg | tatttttagt  | agagatgggg  | tttcaccatg  |
| 5821 | ttgggtcagg | tgggtctgaa  | ctcctgacct | caggtgatct  | ggcaccttgg  | cctcccaaag  |
| 5881 | tgccgggatt | agaggcatga  | gccaccacgc | ccagccttca  | tcacatcttg  | agagaggaca  |
| 5941 | ctgtctgcct | cttgctctga  | tgagggtctg | atgcaaagga  | tagtgagtct  | ctacagtga   |
| 6001 | cacttaagaa | aggcagcatg  | tgggtgctca | caggtcaggc  | ggaggagggg  | gagctgggtg  |
| 6061 | ggaccaggca | tgcttgctc   | cagatcagga | tatgatggca  | ttgggtgcaga | ttatattagt  |
| 6121 | atagaatatg | gtctcaggaa  | ccaggcagga | ctttggcttc  | cgagcagggt  | tcagatccca  |
| 6181 | gcttgggcct | acctgtgcag  | tgagatctca | agcaagtcag  | cctctaagcc  | tcaggttctc  |
| 6241 | cccttgccag | ttcaacagat  | gagctggcct | gggggtgggct | gtgtgggtgat | gggtgctggg  |
| 6301 | ctgggtcctc | tgcccctgca  | gtgtgtctat | gttgcccgaa  | acccaaagga  | cgtggcggtc  |
| 6361 | tcctactacc | atttccaccg  | tatggaaaag | gcgccacctg  | agcctgggac  | ctgggacagc  |
| 6421 | ttcctggaaa | agttcatggc  | tggagaaggt | gggcttgact  | ggagggaagga | gggtgtgaag  |
| 6481 | ccgaggggtg | gtggctataa  | cgtacagcaa | ccctgtgtcg  | gtgccccctg  | cccgttctc   |
| 6541 | tagtgcctca | cgggtcctgg  | taccagcacg | tgcaggagtg  | gtgggagctg  | agccgcaccc  |
| 6601 | accctgttct | ctacctcttc  | tatgaagafa | tgaaggaggt  | gagaccgact  | gtgatgcttc  |



FIG. 7 CONT.

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6661 ccccatgtg acacctggg gcaggcacct cacagggacc caccaaggcc acccagcccc
6721 gtccctgggc ggctcccaca gcaagcccgg attcccatc ctacctccct ggcccaggcc
6781 cccccactgc agccccacct ggcagcaggc tcggcacagc tttcatcttc tgcacctgag
6841 tcagctgcat ggggtggccac ggatcagata cttagtccca ttgcttatcc tcaccaaagg
6901 gtgtgccacc cagggccaca gtcattggaag aagaccatcc cggctctcac ccatagcgcc
6961 caagccctgt tcatgatggg atcacagggc agagatcaat tcattttact ccaagacta
7021 gggccccagg ggttgaggct ctttggggtt tctaggggaa gtggccagat cccctctgag
7081 gttagagagg gggaccggtt ttgttttgct ccactgagga gccctctgct gctcagacc
7141 ccaaaaggga gattcaaaag atcctggagt ttgtggggcg ctccctgccg gaggagacca
7201 tggacttcat ggttcagcac acgtcggtca aggagatgaa gaagaacctt atgaccaact
7261 acaccaccgt cccccaggag ctcattggac acagcatctc ccccttcatg aggaagctg
7321 ggtgctggcc agcacggggg tttggggcg gtgggagcag cagctgcagc ctcccatag
7381 gcacttgggg cctccctgg gatgagactc cagctttgct ccctgccttc ctcccccag
7441 catggctggg gactggaaga ccaccttcac cgtggcgagc aatgagcgct tcgatgcgga
7501 ctatgcggag aagatggcag gctgcagcct cagcttccgc tctgagctgt gagaggggct
7561 cctggagtca ctgcagaggg agtgtgcgaa tctaccctga ccaatgggct caagaataaa
7621 gtatgatttt tgagtcaggc acagtggctc atgtctgcaa tcccagcgat ttgggaggtt
7681 gagctggtag gatcacaata ggccacgaat ttgagaccag cctggtaaaa tagtgagacc
7741 tcatctctac aaagatgtaa aaaaattagc cacatgtgct ggcacttacc tgtagtccca
7801 gctacttggg aagcagaggc tggaggatca tttcagccca ggaggttgtg gatacagtga
7861 gttatgacat gccattcac tacagcctgg atgacaagca agaccctccc tccaaagaaa
7921 ataaagctca attaaaataa aatatgattt gtgttcatgt agagcctgta ttggaaagga
7981 agagaaactc tgagctgaaa gagtgaatgc ccggtggggc cacatatggt cacctctccc
8041 ccagccttca gctccccagg tcaccatata tggggagggg agaaggggtt ggagaagtaa
8101 aaccaggag atgtgtggag gggggatgtc tgtttaatcc cagcacatcc tctgctgtcc
8161 tgcccaaga tgggtggagg cgtcgagtc gccgggcagc gtcacttttt cttgggctcc
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